

CLAIMS:

1. A propellant composition for producing reaction products not having toxic gases in health-endangering concentrations in gas generators, the components of the composition consisting essentially of:

at least one nitrogen-containing compound selected from the group consisting of

(A) a cyanic acid derivative selected from the group consisting of sodium cyanate, cyanuric acid, 1-cyanoguanidine, disodium cyanamide and a salt of disodium cyanamide,

(B) triazine or triazine derivative selected from the group consisting of cyanuric acid ester, cyanuric acid amide, and a salt of disodium cyanamide, and

(C) urea, its salts and a urea derivative selected from the group consisting of biuret, guanidine, nitroguanidine, guanidine nitrate, aminoguanidine, aminoguanidine nitrate, aminoguanidine hydrogen carbonate, azodicarboxylic acid diamide, dicyandiamidine nitrate, dicyandiamidine sulfate, tetrazene, and semicarbizide nitrate; and

an oxidizing agent comprising an inorganic peroxide or comprising a mixture of an inorganic peroxide and a nitrate;

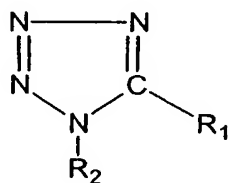
wherein the reaction products of the propellant composition do not contain toxic gases in health-endangering concentrations.

2. A propellant composition according to claim 1, wherein the reaction products of the propellant composition do not contain toxic gases in excess of at least one of MAK and TLV values.

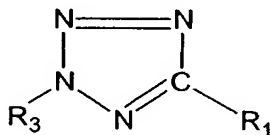
3. A propellant composition for producing reaction products not having the toxic gases in health-endangering concentrations in gas generators, the components of the composition consisting essentially of:

(1) at least one nitrogen-containing compound selected from the group consisting of

(a) tetrazole or a tetrazole derivative of the formulae IA or IB:



IA



IB

wherein R₁ and R₂ or R₃ are identical or different and are hydrogen, hydroxy, amino, carboxy, an alkyl residue of 1-7 carbon atoms, an alkenyl residue of 2-7 carbon atoms, an alkylamino residue of 1-10 carbon atoms, an aryl residue, an arylamino residue, a substituted aryl residue or a substituted arylamino residue, the substituted aryl residue or substituted arylamino residue being substituted by one or several substituents which are identical or different, and which are selected from the group consisting of an amino

group, a nitro group and an alkyl group of 1-4 carbon atoms or a sodium, a potassium or a guanidinium salt of said tetrazole or tetrazole derivative, and

(b) at least one compound selected from the group consisting of

(A) a cyanic acid derivative selected from the group consisting of sodium cyanate, cyanuric acid, 1-cyanoguanidine, disodium cyanamide and a salt of disodium cyananide,

(B) triazine or triazine derivative selected from the group consisting of cyanuric acid ester, cyanuric acid amide, and their salts, and

(C) urea, its salts and a urea derivative selected from the group consisting of biuret, guanidine, nitroguanidine, guanidine nitrate, aminoguanidine, aminoguanidine nitrate, aminoguanidine hydrogen carbonate, azodicarboxylic acid diamide, dicyandiamidine nitrate, dicyandiamidine sulfate, tetrazene, and semicarbizide nitrate; and

(2) an oxidizing agent comprising a peroxide or comprising a mixture of a peroxide and a nitrate;

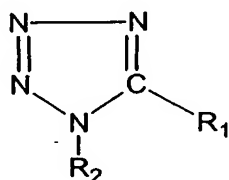
wherein the reaction products of the propellant composition do not contain toxic gases in health-endangering concentrations.

4. A propellant composition according to claim 3, wherein the reaction products of the propellant composition do not contain toxic gases in excess of at least one of MAK and TLV values.

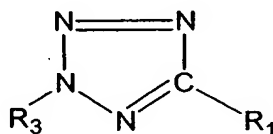
5. A propellant composition for producing reaction products not having toxic gases in health-endangering concentrations in gas generators, the components of the composition consisting essentially of:

(1) at least one nitrogen-containing compound selected from the group consisting of

(a) tetrazole or a tetrazole derivative of the formulae IA or IB:



IA



IB

wherein R₁ and R₂ or R₃ are identical or different and are hydrogen, hydroxy, amino, carboxy, an alkyl residue of 1-7 carbon atoms, an alkenyl residue of 2-7 carbon atoms, an alkylamino residue of 1-10 carbon atoms, an aryl residue, an arylamino residue, a substituted aryl residue or a substituted arylamino residue, the substituted aryl residue or substituted arylamino residue being substituted by one or several substituents which are identical or different, and which are selected from the group consisting of an amino group, a nitro group and an alkyl group of 1-4 carbon atoms or a sodium, a potassium or a guanidinium salt of said tetrazole or tetrazole derivative, and

(b) at least one compound selected from the group consisting of

(A) a cyanic acid derivative selected from the group consisting of sodium cyanate, cyanuric acid, 1-cyanoguanidine, disodium cyanamide and a salt of disodium cyanamide,

(B) triazine or triazine derivative selected from the group consisting of cyanuric acid ester, cyanuric acid amide and their salts, and

(C) urea, its salts and a urea derivative selected from the group consisting of biuret, guanidine, nitroguanidine, guanidine nitrate, aminoguanidine, aminoguanidine nitrate, aminoguanidine hydrogen carbonate, azodicarboxylic acid diamide, dicyandiamidine nitrate, dicyandiamidine sulfate, tetrazene, and semicarbazide nitrate;

an oxidizing agent comprising a peroxide or comprising a mixture of a peroxide and a nitrate; and

coolants, reducing agents and catalysts;

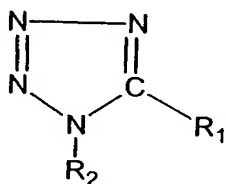
wherein the reaction products of the propellant composition do not contain toxic gases in health-endangering concentrations.

6. A propellant composition according to claim 5, wherein the reaction products of the propellant composition do not contain toxic gases in excess of at least one of MAK and TLV values.

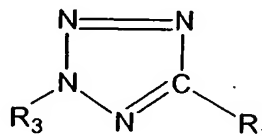
7. A propellant composition for producing reaction products not having toxic gases in health-endangering concentrations in gas generators, the components of the composition consisting essentially of:

at least one nitrogen-containing compound selected from the group consisting of

(a) tetrazole or a tetrazole derivative of the formulae IA or IB:



IA



IB

wherein R₁ and R₂ or R₃ are identical or different and are hydrogen, hydroxy, amino, carboxy, an alkyl residue of 1-7 carbon atoms, an alkenyl residue of 2-7 carbon atoms, an alkylamino residue of 1-10 carbon atoms, an aryl residue, an arylamino residue, a substituted aryl residue or a substituted arylamino residue, the substituted aryl residue or substituted arylamino residue being substituted by one or several substituents which are identical or different, and which are selected from the group consisting of an amino group, a nitro group and an alkyl group of 1-4 carbon atoms or a sodium, a potassium or a guanidinium salt of said tetrazole or tetrazole derivative, and

(b) at least one compound selected from the group consisting of

(A) a cyanic acid derivative selected from the group consisting of sodium cyanate, cyanuric acid, 1-cyanoguanidine, disodium cyanamide and a salt of sodium cyanamide,

(B) triazine or triazine derivative selected from the group consisting of cyanuric acid ester, cyanuric acid amide and their salts, and

(C) urea, its salts and a urea derivative selected from the group consisting of biuret, guanidine, nitroguanidine, guanidine nitrate, aminoguanidine, aminoguanidine nitrate, aminoguanidine hydrogen carbonate, azodicarboxylic acid diamide, dicyandiamidine nitrate, dicyan-diamidine sulfate, tetrazene, and semicarbide nitrate;

an oxidizing agent comprising a peroxide or comprising a mixture of a peroxide and a nitrate; and

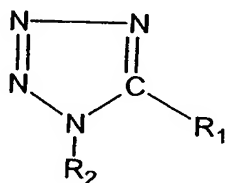
ferrocene as a catalyst;

wherein the reaction products of the propellant composition do not contain toxic gases in health-endangering concentrations.

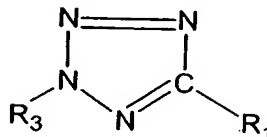
8. A propellant composition according to claim 7, wherein the reaction products of the propellant composition do not contain toxic gases in excess of at least one of MAK and TLV values.

9. A propellant composition for producing reaction products not having toxic gases in health-endangering concentrations in gas generators, the components of the composition consisting essentially of:

(1) at least one nitrogen-containing compound selected from the group consisting of tetrazole or a tetrazole derivative of the formulae IA or IB:



IA



IB

wherein R₁ and R₂ or R₃ are identical or different and are hydrogen, hydroxy, amino, carboxy, an alkyl residue of 1-7 carbon atoms, an alkenyl residue of 2-7 carbon atoms, an alkylamino residue of 1-10 carbon atoms, an aryl residue, an arylamino residue, a substituted aryl residue or a substituted arylamino residue, the substituted aryl residue or substituted arylamino residue being substituted by one or several substituents which are identical or different, and which are selected from the group consisting of an amino group, a nitro group and an alkyl group of 1-4 carbon atoms or a sodium, a potassium or a guanidinium salt of said tetrazole or tetrazole derivative, and

(2) an oxidizing agent, wherein the oxidizing agent is an inorganic peroxide or comprising a mixture of an inorganic peroxide and a nitrate;

wherein the reaction products of the propellant composition do not contain toxic gases in health-endangering concentrations.

10. A propellant composition according to claim 9, wherein the reaction products of the propellant composition do not contain toxic gases in excess of at least one of MAK and TLV values.